

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (currently amended) An isolated *Piscirickettsia salmonis* 45 Kda (<sup>Px</sup>p45) protein or recombinant polypeptide comprising at least one of the following an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence of SEQ ID NO: 2 or SEQ ID NO: 4 comprising a conservative amino acid substitution; and

(b) the amino acid sequence of SEQ ID NO: 2 or SEQ ID NO: 4 comprising at least one conservative amino acid substitution an amino acid sequence that has at least 70% identity with the amino acid sequence of SEQ ID NOs: 2 or 4.

2. (cancelled).

3. (cancelled).

4. (currently amended) The recombinant polypeptide of Claim [[3]] 1 that is a chimeric protein.

5. (cancelled).

6. (currently amended) An isolated or recombinant nucleic acid encoding at least one of the following:

(a) the isolated <sup>Px</sup>p45 protein or recombinant polypeptide of Claim 1;

(b) ~~the isolated antigenic fragment of Claim 2;~~

(c) ~~the recombinant polypeptide of Claim 3; and~~

(d) ~~the recombinant polypeptide of Claim 4.~~

7. (previously presented) The nucleic acid of Claim 6 comprising a nucleotide sequence

selected from the group consisting of SEQ ID NO:1 and SEQ ID NO:3.

8. (previously presented) A nucleic acid that hybridizes to the nucleotide sequence of Claim 7; wherein said nucleic acid comprises at least 12 nucleotides.

9. (currently amended) An expression vector, comprising the nucleic acid of ~~any of Claims 6-8~~ Claim 7, and a transcriptional control sequence, wherein the nucleic acid is operatively linked to the transcriptional control sequence.

10. (previously presented) A host cell that comprises the expression vector of Claim 9.

11. (currently amended) A method for producing a P<sub>s</sub>p45 recombinant polypeptide comprising culturing the host cell of Claim 10 in a culture medium, wherein the host cell expresses the nucleic acid encoding the recombinant P<sub>s</sub>p45 polypeptide; and whereby the recombinant P<sub>s</sub>p45 polypeptide is produced.

12. (previously presented) The method of Claim 11 wherein the host cell is an *E. coli* cell.

13. (currently amended) A method of obtaining a purified recombinant P<sub>s</sub>p45 polypeptide comprising purifying the recombinant polypeptide produced by the method of Claim 12 from the culture medium.

14. (previously presented) The purified recombinant P<sub>s</sub>p45 polypeptide obtained by the method of Claim 13.

15. (previously presented) A recombinant *Yersinia ruckeri* cell comprising the nucleic acid of ~~any of Claims 6-8~~ expression vector of Claim 9.

16. (previously presented) The recombinant *Yersinia ruckeri* cell of Claim 15 that has the BCCM accession No. of LMG P-22044.

17. (previously presented) A *Yersinia ruckeri* cell having the BCCM accession No. LMG P-22511.

18. (currently amended) A vaccine that comprises at least one of the following:

- (a) the isolated <sup>P<sub>s</sub></sup>p45 protein or recombinant <sup>P<sub>s</sub></sup>p45 polypeptide of Claim 1 [[:]]
- (b) ~~the isolated antigenic fragment of Claim 2;~~
- (c) ~~the recombinant polypeptide of Claim 3; and~~
- (d) ~~the recombinant polypeptide of Claim 4.~~

19. (currently amended) A vaccine that comprises the nucleic acid of ~~any of Claims 6-8~~  
Claim 6.

20. (currently amended) A vaccine comprising the recombinant *Yersinia ruckeri* cell of Claim 15 ~~or 16.~~

21. (previously presented) The vaccine of Claim 20, wherein said recombinant *Yersinia ruckeri* cell is a bacterin.

22. (previously presented) A vaccine comprising the recombinant *Yersinia ruckeri* cell of Claim 17.

23. (previously presented) The vaccine of Claim 22, wherein said recombinant *Yersinia ruckeri* cell is a bacterin.

24. (previously presented) The vaccine of Claim 23, further comprising a second *Yersinia ruckeri* cell having the BCCM accession No. LMG P-22044, wherein said second *Yersinia ruckeri* cell is a bacterin.

25. (previously presented) The vaccine of any of Claims 18-24 or 45 further comprising an antigen obtained from an Infectious Pancreatic Necrosis (IPN) virus.

26. (previously presented) The vaccine of Claim 25 wherein the antigen obtained from the IPN virus is selected from the group consisting of the VP2 var protein and the VP3 protein.

27. (currently amended) The vaccine of any of Claims 18-24 or 45 further comprising both the VP2 var protein and the VP3 protein from Infectious Pancreatic Necrosis (IPN) virus.

28. (previously presented) The vaccine of Claim 27 wherein the VP2 var protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20069 and the VP3 protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20071.

29. (previously presented) The vaccine of Claim 27 wherein the VP2 var protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20070 and the VP3 protein is obtained from a transformed *Pichia pastoris* cell, BCCM Accession No. IHEM 20072.

30. (currently amended) The vaccine of any of Claims ~~18-29~~ 18-24 or 45 that further comprises an antigen obtained from *Aeromonas salmonicida*.

31. (currently amended) A method of protecting a fish from salmonid rickettsial septicemia comprising administering to the fish the vaccine of any of Claims ~~18-30~~ 18-24 or 45.

32. (previously presented) The method of Claim 31 wherein the fish is a teleost.

33. (previously presented) The method of Claim 32 wherein the teleost is a salmonid.

34. (previously presented) A method of protecting a fish from salmonid rickettsial

septicemia and Infectious Pancreatic Necrosis comprising administering to the fish the vaccine of any of Claims ~~25-30~~ 18-24 or 45.

35. (previously presented) The method of Claim 34 wherein the fish is a salmonid.

36. (currently amended) The method of Claim 33 ~~or 35~~ wherein the salmonid is selected from the group consisting of a *Salmo salar* (Atlantic salmon), an *Oncorhynchus kisutch* (coho salmon) and an *Oncorhynchus mykiss* (rainbow trout).

37. (cancelled).

38. (cancelled).

39. (cancelled).

40. (cancelled).

41. (cancelled).

42. (cancelled).

43. (new) The nucleic acid of claim 8 that hybridizes to the nucleotide sequence of Claim 7 under stringent conditions wherein the  $T_m$  is 65°C.

44. (new) The method of Claim 35 wherein the salmonid is selected from the group consisting of a *Salmo salar* (Atlantic salmon), an *Oncorhynchus kisutch* (coho salmon) and an *Oncorhynchus mykiss* (rainbow trout).

45. (new) A vaccine comprising the recombinant *Yersinia ruckeri* cell of Claim 16.